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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,334	12/28/2000	Jonathan M. Zweig	003239 .P072	7667

8791 7590 12/13/2005

BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER	
ELALLAM, AHMED	

ART UNIT	PAPER NUMBER
2668	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/751,334	ZWEIG ET AL.	
	Examiner	Art Unit	
	AHMED ELALLAM	2668	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-32 and 41-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-32 and 41-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/19/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is responsive to RCE filed on September 19, 2005.

Claims 17-32, 41-46 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 17, 18, 21, 22, 25, 26, 29, 30, and 41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi, U.S. Patent No (6,256,334) in view of Sindhushayana et al, (US 6,064,678). Hereinafter referred to as Adashi and Sindhushayana respectively.

Regarding claim 17, with reference to figure 3, Adachi discloses a method of wireless communications comprising:

adding RTS/CTS frame to a synchronization frame to be notified to the terminal station 2, see column 15, lines 33-44,

adding a maximum packet length to the synchronization frame. See column 15, lines 33-44, column 23, lines 27-34 and figure 10 steps 48 and 49. (Examiner interpreted the added maximum packet length as being the claimed message including a second control data that causes said one or more wireless units to automatically

adjust fragmentation threshold in response to changes in the wireless transmission medium).

Adashi further discloses counting the number of retransmissions (claimed measuring a transmission error factor) due to collisions/contention (claimed changes within the transmission medium) and using that number in adjusting the maximum data packet length (claimed fragmentation threshold) to be transmitted, see column 15, lines 19-25. (Claimed measuring a transmission error factor and adjusting the fragmentation threshold in accordance with the measured transmission error).

Regarding claim 21, with reference to figures 1 and 3, Adashi discloses a radio base station 1 (claimed access point) having an RTS/CTS-addition-and-packet-length-setting Section 68 in combination with SYNCH Frame transmission section 51 that transmit a synchronization message (claimed message) having RTS/CTS frame (claimed first control data) and maximum packet length (claimed second control data) to a plurality of terminal stations (figure3, units 2), see column 15, lines 33-44. and column 23, lines 27-34 and figure 10 steps 48 and 49. Adashi further discloses dynamically counting the number of retransmissions due to collisions/contention, and using that number in adjusting the maximum data packet length to be transmitted, see column 15, lines 19-25. (Examiner interpreted the combination of the units 68 and 51 as being the claimed logic circuit). (Claimed an access point having a logic circuit to transmit a message to one or more associated wireless unit, the message includes a first control data that causes one or more associated wireless units to implement RTC/CTS in transmitting data packets to the access point, and a second control data

that causes one or more wireless unit to automatically adjust a fragmentation threshold in responses to changes within the wireless transmission medium, the logic continue to adjust the fragmentation threshold through subsequent messages based on a measured transmission error factor). (Examiner interpreted the dynamic maximum packet length adjustment by the RTS/CTS-addition-and-packet-length-setting Section 68, (see column 15, lines 1-44) as being the claimed logic continue to adjust the fragmentation threshold through subsequent messages based on a measured transmission error factor and the collision/contention as being the claimed changes to the wireless transmission medium).

Regarding claim 29, with reference to figure 2, Adachi discloses a wireless terminal stations 2, comprising:

a plurality of sections 72-78 to communicate with a radio base station 1 (figure3); (claimed a wireless transceiver to communicate with an access point via a wireless transmission medium);

a SYNCH FRAME RECEPTION SECTION 70, (claimed logic circuit) to receive synchronization message having an RTS/CTS frame synchronization message (claimed message) having RTS/CTS frame (claimed first control data) and maximum packet length (claimed second control data that causes automatic adjustment of the fragmentation threshold). See column 15, lines 33-44. Adashi further discloses dynamically counting the number of retransmissions due to collisions/contention, and using that number in adjusting the maximum data packet length to be transmitted, see column 15, lines 19-25. (Examiner interpreted the combination of the units 68 and 51 as

being the claimed logic circuit). (Claimed logic circuit to receive a message from said access point by way of the wireless transceiver, wherein the message includes a first control data that causes the wireless unit to use request to send (RTS) and clear to send (CTS) in transmission of the data to the access point, and second control data that causes automatic adjustment of a fragmentation threshold supported by the wireless unit in response to changes in the wireless medium, the logic circuit to continue to adjust the fragmentation threshold through subsequent messages based on a measured transmission error factor). (Examiner interpreted the dynamic maximum packet length adjustment by the RTS/CTS-addition-and-packet-length-setting Section 68, (see column 15, lines 1-44) as being the claimed logic continue to adjust the fragmentation threshold through subsequent messages based on a measured transmission error factor, and the collision/contention as being the claimed changes to the wireless transmission medium).

Regarding claim 41, with reference to figures 1 and 3, Adashi discloses a radio base station 1 (claimed access point) having an RTS/CTS-addition-and-packet-length-setting Section 68 in combination with SYNCH Frame transmission section 51 that transmit a synchronization message having RTS/CTS frame (claimed second control data) and maximum packet length (claimed first control data) that causes automatic adjustment of the fragmentation threshold), see column 15, lines 33-44, and column 23, lines 27-34 and figure 10 steps 48 and 49. Adashi further discloses dynamically counting the number of retransmissions due to collisions/contention, and using that number in adjusting the maximum data packet length to be transmitted to a plurality of

terminal stations (figure3, units 2), see column 15, lines 19-25. (Examiner interpreted the combination of the units 68 and 51 as being the claimed logic circuit. In addition Adashi discloses that the synchronization frame comprises a maximum packet length to be used in fragmenting data for transmission (Claimed an access point having a logic circuit to transmit a message to one or more associated wireless unit, the message includes a first control data that causes one or more associated wireless units to implement a fragmentation threshold in transmitting data packets to the access point and a second control data that causes said one or more wireless unit to use request to send (RTC) and clear to send (CTS) in transmission of data to the access point, the logic circuit to continue to adjust the fragmentation threshold through subsequent messages based on a measured error rate).

As to claims 17, 21, 29 and 41:

The difference between Adashi and these claims is that Adashi does not specify that the adjustment of the fragmentation is based on a finite time duration for data packet transmission taking in account a size of each data packet and a data rate for transmission of each data packet.

(Examiner interpreted this limitation in accordance with the specification in which it is stated that the time duration of a data packet is given by the size of the packet divided by the data rate, and wherein changes in the data rate are taken into account when fragmentation is employed in order maintain the desired duration for the packet. See page 14, lines 21-33, thus such limitation is interpreted to mean that when fragmenting packet, data rate is taken into account).

However, Sindhushayana discloses choosing packet lengths (fragmentation threshold) in accordance with data transmission rates. See column 2, lines 55-65.

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made enhance the fragmentation threshold selection of Adashi with a corresponding data transmission rate as taught by Sindhushayana so that the optimal fragmentation threshold can be used (optimal data packet length). The advantage would be the ability to maximize the throughput of the system by choosing the optimal packet length for each subscriber in transmitting data at an appropriate data rate. See Sindhushayana, column 3, lines 14-29.

Regarding claim 25, 44 and 45, with reference to figures 3 and 4, Adashi discloses an MPU (Microprocessor Unit) 21 that controls each of the constituent elements attached to it over the bus 29 and manages the terminal station 2 under control of the radio base station 1. See column 10, lines 15-19. Adashi further discloses that the radio base station 1 having an RTS/CTS-addition-and-packet-length-setting Section 68 in combination with SYNCH Frame transmission section 51 that transmit a synchronization message having RTS/CTS frame (claimed first control data) and maximum packet length (claimed second control data) to a plurality of terminal stations (figure3, units 2), see column 15, lines 33-44, and column 23, lines 27-34 and figure 10 steps 48 and 49. Further Adashi discloses dynamically counting the number of retransmissions due to collisions/contention, and using that number in adjusting the maximum data packet length to be transmitted, see column 15, lines 19-25. (Examiner interpreted the combination of the units 68 and 51 as being the claimed logic circuit and

the dynamic maximum packet length adjustment by the RTS/CTS-addition-and-packet-length-setting Section 68 (see column 15, lines 1-44) as being the claimed logic continue to adjust the fragmentation threshold through subsequent messages based on a measured transmission error factor, and the collision/contention as being the claimed changes to the wireless transmission medium).

As to claims 25, 44 and 45:

The difference between Adashi and claims 25, 44 and 45, is that Adashi does not specify that the adjustment of the fragmentation is based on a finite time duration for data packet transmission taking in account a size of each data packet and a data rate for transmission of each data packet. (Examiner interpreted this limitation in accordance with the specification in which it is stated that the time duration of a data packet is given by the size of the packet divided by the data rate, and wherein changes in the data rate are taken into account when fragmentation is employed in order maintain the desired duration for the packet. See page 14, lines 21-33, thus such limitation is interpreted to mean that when fragmenting packet, data rate is taken into account).

However, Sindhushayana discloses choosing packet lengths (fragmentation threshold) in accordance with data transmission rates. See column 2, lines 55-65.

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made enhance the fragmentation threshold selection of Adashi with a corresponding data transmission rate as taught by Sindhushayana so that the optimal fragmentation threshold can be used (optimal data packet length). The advantage would be the ability to maximize the throughput of the system by choosing

the optimal packet length for each subscriber in transmitting data at an appropriate data rate. See Sindhushayana, column 3, lines 14-29.

Adashi in view of Sindhushayana do not explicitly disclose a software routine to control the elements of the base station. However, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to load control software in the corresponding elements of Adashi in view of Sindhushayana so that the Adashi in view of Sindhushayana's system would be up-gradable. The advantage would be the ability to add other features to the system of Adashi in view of Sindhushayana as the wireless LAN technology evolves (i.e. RTS/CTS in combination with QoS).

Regarding claim 26, Adashi discloses the use of RTS/CTS frame is notified to each terminal station 2 by way of the synchronization frame signal. See column 23, lines 29-34. (Examiner interpreted the notification of each terminal station by way of the synchronization frame, as being the claimed *message comprises a multicast data packet intended for said one or more associated wireless unit,* because only the terminal stations that are within the base station cell that would be able to receive the synchronization frame, and that reads on the multicasting feature).

Regarding claims 18, 22, 30, and 42, Adashi discloses the use of RTS/CTS frame is notified to each terminal station 2 by way of the synchronization frame signal. See column 23, lines 29-34. (Examiner interpreted the notification of each terminal station by way of the synchronization frame, as being the claimed *message comprises a multicast data packet intended for said one or more associated wireless unit,* because

only the terminal stations that are within the base station cell would be able to receive the synchronization frame, and that reads on the multicasting feature).

Regarding claim 43, Adashi discloses dynamic change of the maximum packet length by having the maximum packet length set to a smaller length or larger length. See column 15, lines 19-32. (Claimed message includes a specified fragmentation threshold to be used by the one ore more associated wireless unit, because it inherent to Adashi that the smaller (or larger) thresholds are specified since the message contains the length of the packet as the fragmentation indication to be used).

2. Claims 19, 20, 23, 24, 27, 28, 31, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adashi in view of Sindhushayana as applied to respective claims 17, 29, and 44 above, and further in view of Fisher, US (5,889,772). Hereinafter referred to as Fisher.

Regarding claims 19, and 31, Adashi in view of Sindhushayana discloses substantially all the limitations of respective parent claims 17, and 29 as indicated above. In addition Adashi also discloses dynamic change of the maximum packet length (claimed adjusting fragmentation threshold), that is determined by the base station wherein the maximum packet length is set to a smaller length or larger length based on the number of occurrences of collisions/contention (claimed transmission error factor), see column 15, lines 19-32. (Claimed second message includes a current fragmentation threshold being determined by the access point).

The difference between Adashi in view of Sindhushayana and claims 19, 31 is that Adashi in view of Sindhushayana do not specify comparing the "transmission error factor" to an upper threshold and reducing a prior fragmentation threshold to the current fragmentation threshold if the transmission error factor is greater than the upper threshold and comparing the transmission error to a lower threshold and increasing the prior fragmentation threshold to the current fragmentation threshold if the transmission error factor is less than the lower threshold.

However, Fischer discloses automatically adjusting the fragmentation threshold comprises

comparing the transmission error factor to an upper threshold, and decreasing the fragmentation threshold if the transmission error factor is above the upper threshold (Fischer's embodiment allows the fragmentation threshold to be dynamically adjusted to maximize the WLAN throughput for the current operating conditions. The fragmentation threshold is adjusted according to the bit error rate ratios between a transmitting station and a receiving station. If the BER reaches a certain higher value, the monitor and adjust unit 112 lower the fragmentation threshold until the packets have a lower rate of error; for example see column 12 lines 7-20 and 42-55);

comparing the transmission error factor to a lower threshold, and increasing the fragmentation threshold if the transmission error factor is below the lower threshold if the BER reaches a certain lower value, it is inherent the monitor and adjust unit 112 will raise the fragmentation threshold until the packets have an acceptable

rate of error to maximize throughput; see column 3 lines 65-67 and column4 lines 34-38).

it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the dynamic fragmentation method of Fisher in lieu of that of Adashi in view of Sindhushayana so that the throughput of Adashi in view of Sindhushayana system will be increased while maintaining a range of tolerable number of retransmissions. A person of skill in the art would be motivated to do so by recognizing the advantage of having an upper and lower fragmentation limits in shaping the traffic load in the wireless medium of Adashi in view of Sindhushayana instead the single comparing step of Adashi. In addition, it would be advantageous to provide the ability to limit the number of error within an acceptable range for data transmission, and similarly enable the system Adashi in view of Sindhushayana to provide wireless QoS by assigning different threshold limits to different classes of traffic.

Regarding claims 20, 28, Adashi in view of Sindhushayana discloses dynamic change of the maximum packet length by having the maximum packet length set to a smaller length or larger length based on the number of occurrences of collisions/contention (claimed transmission error factor), see Adashi, column 15, lines 19-32. But do not disclose dividing the maximum packet length (claimed maximum packet by a divisional factor).

However, Fisher discloses adjusting the fragmentation threshold level for providing fragmentation of data frames to be transmitted according to the ratio of the incremented count of the failures to the incremented count of the attempts (i.e. BER (bit

error rate)) (claimed divisional factor), see column 12, lines 6-12, and based on the calculated BER ratio, the fragmentation threshold level is adjusted, see column12, lines 14-18.

it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the BER divisional factor of Fisher in adjusting (determining) the fragmentation threshold of Adashi in view of Sindhushayana so that instead of fragmenting the packets based on the number of collisions/contention, the BER (Bit Error Rate) would give a more precise tolerance level of errors in the transmission of data. A person of skill in the art would be motivated to do so by recognizing the possibility of not exceeding the level of errors permissible in the implementation of different traffic priorities. It would also be advantageous to provide specific BER thresholds for each wireless unit in accordance with the type of traffic between each wireless unit and the base station.

Regarding claim 46, Adashi in view of Sindhushayana discloses dynamic change of the maximum packet length by having the maximum packet length set to a smaller length or larger length. See Adashi column 15, lines 19-32. (Claimed message includes a specified fragmentation threshold to be used by the one ore more associated wireless unit, because it inherent to Adashi that the smaller (or larger) thresholds are specified since the message contain the length of the packet as the fragmentation indication to be used).

Regarding claim 23, 24, 27, Adashi in view of Sindhushayana discloses substantially all the limitations of respective parent claims 21 and 25 as indicated above.

In addition, Adashi also discloses dynamic change of the maximum packet length (claimed adjusting fragmentation threshold), that is determined by the base station wherein the maximum packet length is set to a smaller length or larger length based on the number of occurrences of collisions/contention (claimed transmission error factor), see column 15, lines 19-32. (Claimed second message includes a current fragmentation threshold being determined by the access point). (Examiner interpreted Sindhushayana increase or decrease of packet length as being the claimed increase or decrease of finite time duration, see Sindhushayana, Abstract, column 3, lines 14-29).

The difference between Adashi in view of Sindhushayana and claims 23, 24, 27, and 28 is that Adashi does not specify comparing the "transmission error factor" to a lower threshold and increasing the prior fragmentation threshold to the current fragmentation threshold if the transmission error factor is less than the lower threshold (as indicated in claim 23), and comparing the transmission error an upper threshold and reducing a prior fragmentation threshold to the current fragmentation threshold if the transmission error factor is greater than the upper threshold (as indicated in claims 23, 24 and 27).

However, Fischer discloses automatically adjusting the fragmentation threshold comprises

comparing the transmission error factor to a lower threshold, and increasing the fragmentation threshold if the transmission error factor is below the lower threshold if the BER reaches a certain lower value, it is inherent the monitor and adjust unit

112 will raise the fragmentation threshold until the packets have an acceptable rate of error to maximize throughput; see column 3 lines 65-67 and column4 lines 34-38).

comparing the transmission error factor to an upper threshold, and decreasing the fragmentation threshold if the transmission error factor is above the upper threshold (Fischer's embodiment allows the fragmentation threshold to be dynamically adjusted to maximize the WLAN throughput for the current operating conditions. The fragmentation threshold is adjusted according to the bit error rate ratios between a transmitting station and a receiving station. If the BER reaches a certain higher value, the monitor and adjust unit 112 lower the fragmentation threshold until the packets have a lower rate of error; for example see column 12 lines 7-20 and 42-55);

it would have been obvious to a person of ordinary skill in the art, at the time the invention was made to use the BER divisional factor of Fisher in adjusting (determining) the fragmentation threshold of Adashi in view of Sindhushayana so that instead of fragmenting the packets based on the number of collisions/contention, the BER (Bit Error Rate) would give a more precise tolerance level of errors in the transmission of data. A person of skill in the art would be motivated to do so by recognizing the possibility of not exceeding the level of errors permissible in the implementation of different traffic priorities. It would also be advantageous to provide specific BER thresholds for each wireless unit in accordance with the type of traffic between each wireless unit and the base station.

3. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adashi in view Sindhushayana and further of Fisher, US (5,889,772) and further in view of Fisher US (6,640,325). Hereinafter referred to as Fisher'772 and Fisher'325 respectively.

Regarding claim 32, Adashi in view Sindhushayana discloses dynamic change of the maximum packet length (claimed fragmentation threshold) by having the maximum packet length set to a smaller length or larger length in the synchronization frame (claimed second control data) based on the collision/contentions, (the smaller length is provided within the synchronization frame (claimed synchronization frame provided in real-time)). See Adashi column 15, lines 19-32. Adashi does not explicitly disclose the smaller fragmentation threshold is provided in response to a change in the wireless transmission medium due to interference.

However, Fisher'772 discloses adjusting a fragmentation threshold based on BER (Bit error rate), see column12, lines 6-18.

Fisher'325 discloses that all the networks are subject to interference that is a source of bit errors. See column 1, lines 19-37.

It would have been obvious to adjust the maximum packet length to the smaller value of Adashi, using the bit error rate calculation of fisher'772 by recognizing the level of errors versus the interference level as indicated by Fisher'325 so that the fragmenting of the packets in the system of Adashi in view Sindhushayana would be in accordance with the level of interferences from various sources. The advantage would

be the ability to transmit data within a tolerable error levels in the presence of variable interference conditions.

Response to Arguments

4. Applicant's arguments with respect to claims 17-32, 41-46 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Chuah, US (6,469,991).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AHMED ELALLAM whose telephone number is (571) 272-3097. The examiner can normally be reached on 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AHMED ELALLAM
Examiner
Art Unit 2668
12/5/05

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER